



TIMBER NOTICE OF SALE

SALE NAME: LIBERTY

AGREEMENT NO: 30-106233

AUCTION: June 13, 2024 starting at 10:00 a.m.,
Southeast Region Office, Ellensburg, WA

COUNTY: Klickitat

SALE LOCATION: Sale located approximately 5 miles north of Appleton, WA

**PRODUCTS SOLD
AND SALE AREA:**

All timber not marked in blue leave tree paint or bound by leave tree tags in Unit 1;
delineated by timber sale boundary tags and pink flagging.

All forest products above located on part(s) of Section 3 all in Township 4 North, Range
12 East, W.M., containing 60 acres, more or less.

CERTIFICATION: This sale is certified under the Sustainable Forestry Initiative® program Standard (cert
no: BVC-SFIFM-018227)

ESTIMATED SALE VOLUMES AND QUALITY:

Species	Avg Ring DBH Count	Total MBF	MBF by Grade					UT
			SM	1S	2S	3S	4S	
Douglas fir	15.7	781			182	522	76	1
Grand fir	14	228			28	143	27	30

Species	Avg Ring DBH Count	Total MBF	MBF by Grade					UT
			1S	2S	3S	4S	5S	
Ponderosa pine	19.2	7				5	2	
Sale Total		1,016						

MINIMUM BID: \$0.00 **BID METHOD:** Sealed Bids

**PERFORMANCE
SECURITY:** \$0.00 **SALE TYPE:** Lump Sum

EXPIRATION DATE: October 31, 2026 **ALLOCATION:** Export Restricted

BID DEPOSIT: \$0.00 or Bid Bond. Said deposit shall constitute an opening bid at the appraised price.

HARVEST METHOD: Ground-based equipment. Falling and Yarding will not be permitted from November 1st
to April 30th unless authorized in writing by the Contract Administrator. Falling and
Yarding will not be permitted from November 1 to April 30 unless authorized in writing
by the Contract Administrator.

ROADS: 40.15 stations of required reconstruction. 72.90 stations of required prehaul maintenance.
The hauling of forest products will not be permitted from November 1 to April 30 unless
authorized in writing by the Contract Administrator.

ACREAGE DETERMINATION

CRUISE METHOD: The sale acres were determined using a Garmin 64 delineation. Cruise was completed
using variable plot cruise methods.



TIMBER NOTICE OF SALE

FEES: \$17,272.00 is due on day of sale. \$9.00 per MBF is due upon removal. These are in addition to the bid price.

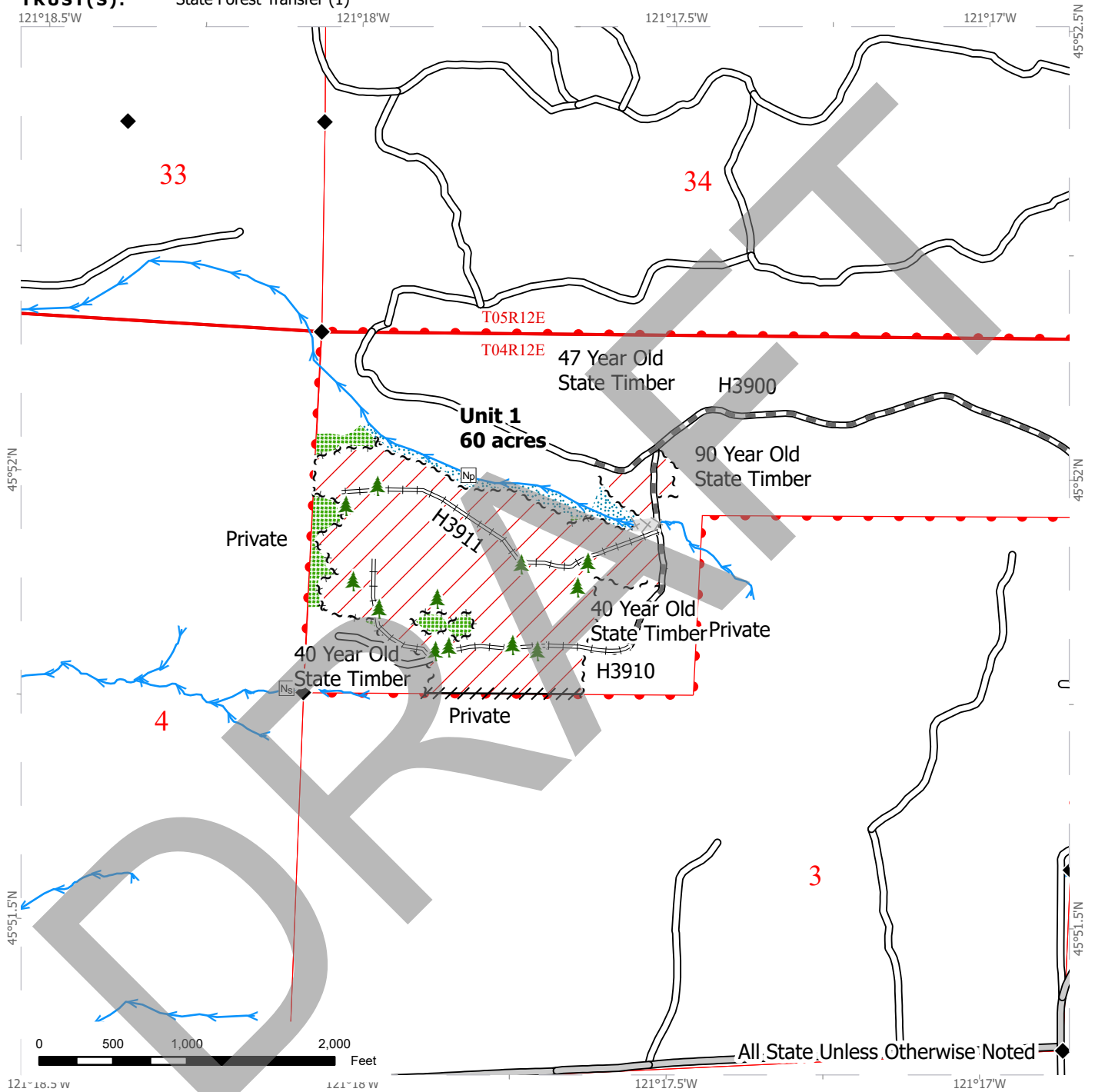
SPECIAL REMARKS: If a Gray Wolf den site is discovered or suspected within 1 mile of the timber sale, a no-harvest temporary seasonal timing restriction will be enforced immediately for the duration of March 15 through July 30.

DRAFT

TIMBER SALE MAP

SALE NAME: LIBERTY
AGREEMENT #: 30-106233
TOWNSHIP(S): T4R12E
TRUST(S): State Forest Transfer (1)

REGION: Southeast Region
COUNTY(S): Klickitat
ELEVATION RGE: 2280-2400

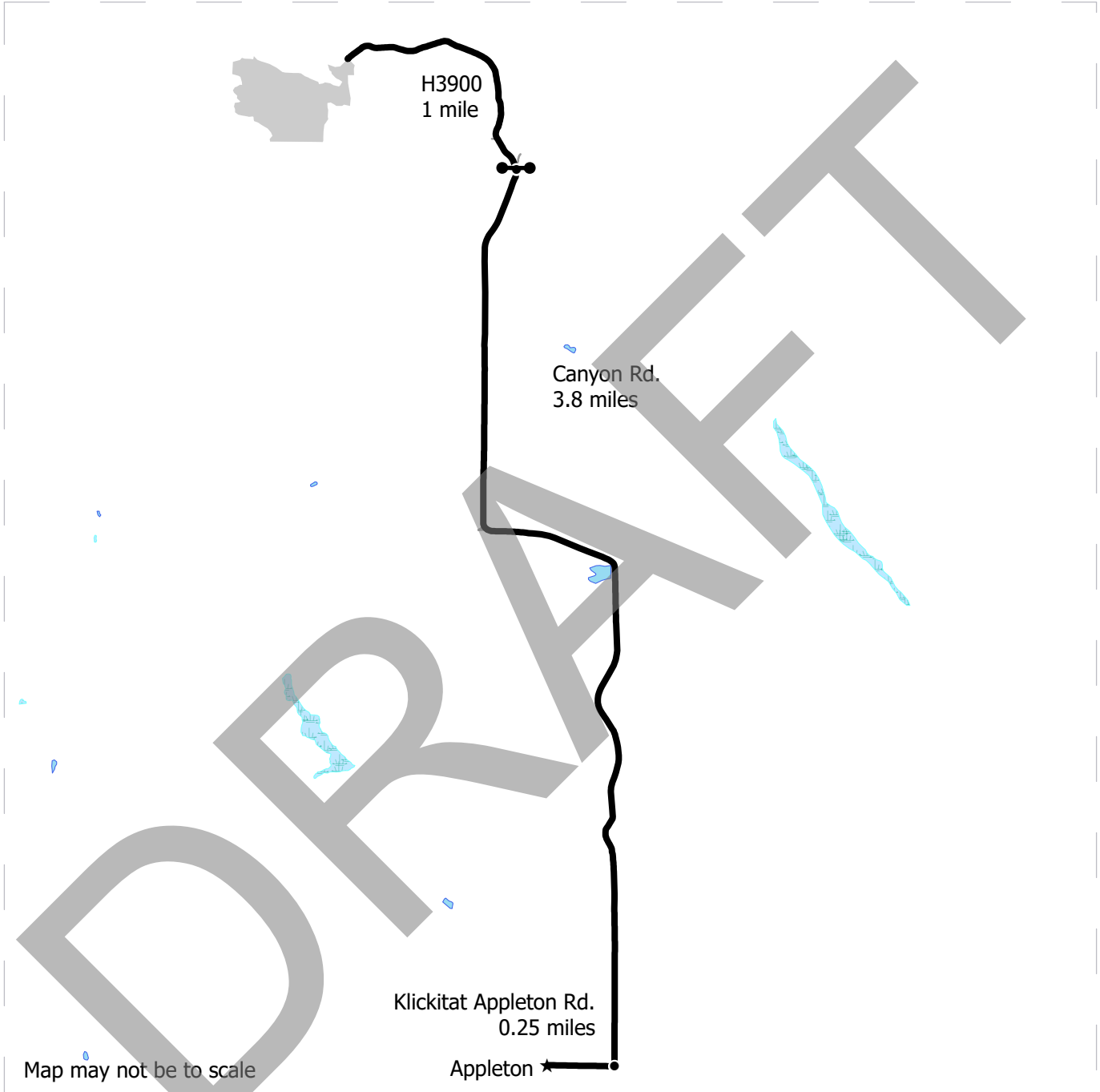


Variable Retention Harvest	County Road	Streams
Leave Tree Area	Required Pre-Haul Maintenance	Non-Fish Perennial
Riparian Mgt Zone	Required Reconstruction	Non-Fish Seasonal
Sale Boundary Tags	Existing Roads	Leave Tree Area < 1/4-acre
Leave Tree Tags	DNR Managed Lands	Survey Monument
Right of Way Tags		
Flag Line		
Equipment Limitation Zone		

DRIVING MAP

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- Harvest Unit
- Haul Route
- Other Route
- Distance Indicator
- Gate
- Town

DRIVING DIRECTIONS:

From Appleton:
Continue east on Klickitat Appleton road for 0.25 miles.
Turn left onto Canyon road and continue for 3.8 miles.
Turn left onto the H3900 and continue for 1 mile. Close Cattle gate before continuing.



Timber Sale Cruise Report Liberty

Sale Name: LIBERTY

Sale Type: LUMP SUM

Region: SOUTHEAST

District: KLICKITAT

Lead Cruiser: Bryan Inglin

Other Cruisers:

Cruise Narrative:

Location:

The sale is approximately # miles north of Appleton, WA and can be accessed via the H3900 state lands road directly from Canyon road. The legal description for the timber sale is Sec. 3 of Township 4N Range 12E.

Cruise Design: Variable Plots.

Almost 1 Plot/1 acres

All 52 plots were cruised using a 46.94 BAF and 160 BAF for selecting cruise trees on plots. All stems ≥ 10 " DBH were cruised. There are three species present on this sale: Douglas-fir (DF), grand fir (GF), and a minor component of ponderosa pine (PP).

Log Length - All species utilized 40' logs when possible, with a minimum log length of 16'. Top bole height for all species was cruised to 40% FP at 16'.

Take/Leave Prescription - The silvicultural prescription for this timber sale is a Seed Tree harvest leaving approximately 13 trees per acre at a variable spacing identified by a blue paint ring or bound by a leave tree area tag. Take all trees ≥ 10 " not painted.

Timber Quality:

Removal volume is 77% DF/22% GF/ 1% PP.

Stand age is approximately 50-60 years old.

Defect primarily occurred in GF due to root rot in lower the bole, as well as dwarf mistletoe and freeze/thaw cracks in the upper bole.

Logging and Stand Conditions:

The majority of the sale is flat with gentle to moderate slopes of less than 15%, the steepest slopes occur within the draws with pitches of up to 35%. The sale is set up primarily for favorable logging however, some adverse skidding will be required.

Timber Sale Notice Volume (MBF)

Sp	DBH	Rings/In	Age	MBF Volume by Grade					Utility
				All	2 Saw	3 Saw	4 Saw	5 Saw	
DF	15.7		55	781	182	522	76		
GF	14.0			228	28	143	27		29
PP	19.2			7			5	2	
ALL	15.2		55	1,016	211	666	108	2	29

Timber Sale Notice Weight (tons)

Sp	Tons by Grade					
	All	2 Saw	3 Saw	4 Saw	5 Saw	Utility
DF	6,807	1,431	4,789	587		
GF	2,191	221	1,519	197		255
PP	36			27	10	
ALL	9,035	1,652	6,307	810	10	255

Timber Sale Overall Cruise Statistics

BA (sq ft/acre)	BA SE (%)	V-BAR (bf/sq ft)	V-BAR SE (%)	Net Vol (bf/acre)	Vol SE (%)
199.5	6.2	105.3	4.0	21,016	7.4

Timber Sale Unit Cruise Design

Unit	Design	Cruise Acres	FMA Acres	N Plots	N Cruise Plots	N Void Plots
LIBERTY U1	BBL: VR, Big BAF (160 Measure, 46.94 Count) Sighting Ht = 4.5 ft	60.0	64.3	52	52	0
All		60.0	64.3	52	52	0

Timber Sale Log Grade x Sort Summary

Sp	Status	Grade	Sort	Dia	Len	BF Gross	BF Net	Defect %	Tons	MBF Net
DF	LIVE	2 SAW	Domestic	13.6	40	3,038	3,038	0.0	1,431.2	182.3
DF	LIVE	3 SAW	Domestic	8.2	39	8,706	8,706	0.0	4,788.9	522.4
DF	LIVE	4 SAW	Domestic	5.8	22	1,274	1,274	0.0	587.2	76.4
GF	LIVE	2 SAW	Domestic	15.9	29	508	475	6.6	220.8	28.5
GF	LIVE	3 SAW	Domestic	7.7	40	2,699	2,389	11.5	1,518.5	143.4
GF	LIVE	4 SAW	Domestic	5.7	19	451	443	1.9	196.6	26.6
GF	LIVE	CULL	Cull	11.7	6	445	0	100.0	0.0	0.0
GF	LIVE	UTILITY	Pulp	6.1	35	490	490	0.0	255.2	29.4
PP	LIVE	4 SAW	Domestic	11.7	32	87	87	0.0	26.5	5.2
PP	LIVE	5 SAW	Domestic	6.1	32	26	26	0.0	9.7	1.6

Timber Sale Log Sort x Diameter Bin Summary

Sp	Bin	Status	Sort	Dia	Len	BF Net	Defect %	Tons	MBF Net
DF	5 - 8	LIVE	Domestic	6.5	31	5,242	0.0	2,925.4	314.5
DF	9 - 11	LIVE	Domestic	10.0	40	4,738	0.0	2,450.8	284.3
DF	12 - 14	LIVE	Domestic	13.3	40	2,340	0.0	1,141.0	140.4
DF	15 - 19	LIVE	Domestic	15.1	40	698	0.0	290.2	41.9
GF	5 - 8	LIVE	Pulp	6.1	35	490	0.0	255.2	29.4
GF	5 - 8	LIVE	Domestic	6.8	32	2,513	9.8	1,486.1	150.8
GF	5 - 8	LIVE	Cull	8.6	8	0	100.0	0.0	0.0
GF	9 - 11	LIVE	Domestic	10.7	40	319	12.0	229.0	19.1
GF	9 - 11	LIVE	Cull	11.5	7	0	100.0	0.0	0.0
GF	12 - 14	LIVE	Cull	13.1	6	0	100.0	0.0	0.0
GF	12 - 14	LIVE	Domestic	14.4	40	298	10.1	151.3	17.9
GF	15 - 19	LIVE	Cull	17.3	1	0	100.0	0.0	0.0
GF	15 - 19	LIVE	Domestic	17.6	16	177	0.0	69.5	10.6
PP	5 - 8	LIVE	Domestic	6.1	32	26	0.0	9.7	1.6
PP	9 - 11	LIVE	Domestic	11.7	32	87	0.0	26.5	5.2

Cruise Unit Report LIBERTY U1

Unit Sale Notice Volume (MBF): LIBERTY U1

Sp	DBH	Rings/In	Age	MBF Volume by Grade					Utility
				All	2 Saw	3 Saw	4 Saw	5 Saw	
DF	15.7		55	781	182	522	76		
GF	14.0			228	28	143	27		29
PP	19.2			7			5	2	
ALL	15.2		55	1,016	211	666	108	2	29

Unit Sale Notice Weight (tons): LIBERTY U1

Sp	Tons by Grade					Utility
	All	2 Saw	3 Saw	4 Saw	5 Saw	
DF	6,807	1,431	4,789	587		
GF	2,191	221	1,519	197		255
PP	36			27	10	
ALL	9,035	1,652	6,307	810	10	255

Unit Cruise Design: LIBERTY U1

Design	Cruise Acres	FMA Acres	N Plots	N Cruise Plots	N Void Plots
BBL: VR, Big BAF (160 Measure, 46.94 Count) Sighting Ht = 4.5 ft	60.0	64.3	52	52	0

Unit Cruise Summary: LIBERTY U1

Sp	Cruised Trees	All Trees	Trees/Plot	Ring-Count Trees
DF	39	161	3.1	0
GF	17	59	1.1	0
PP	1	1	0.0	0
ALL	57	221	4.3	0

Unit Cruise Statistics: LIBERTY U1

Sp	BA (sq ft/acre)	BA CV (%)	BA SE (%)	V-BAR (bf/sq ft)	V-BAR CV (%)	V-BAR SE (%)	Net Vol (bf/acre)	Vol CV (%)	Vol SE (%)
DF	145.3	68.1	9.4	116.3	22.1	3.5	16,902	71.6	10.1
GF	53.3	117.1	16.2	75.1	37.0	9.0	4,000	122.8	18.6

Sp	BA (sq ft/acre)	BA CV (%)	BA SE (%)	V-BAR (bf/sq ft)	V-BAR CV (%)	V-BAR SE (%)	Net Vol (bf/acre)	Vol CV (%)	Vol SE (%)
PP	0.9	721.1	100.0	125.4	0.0	0.0	113	721.1	100.0
ALL	199.5	44.4	6.2	105.3	30.6	4.0	21,016	53.9	7.4

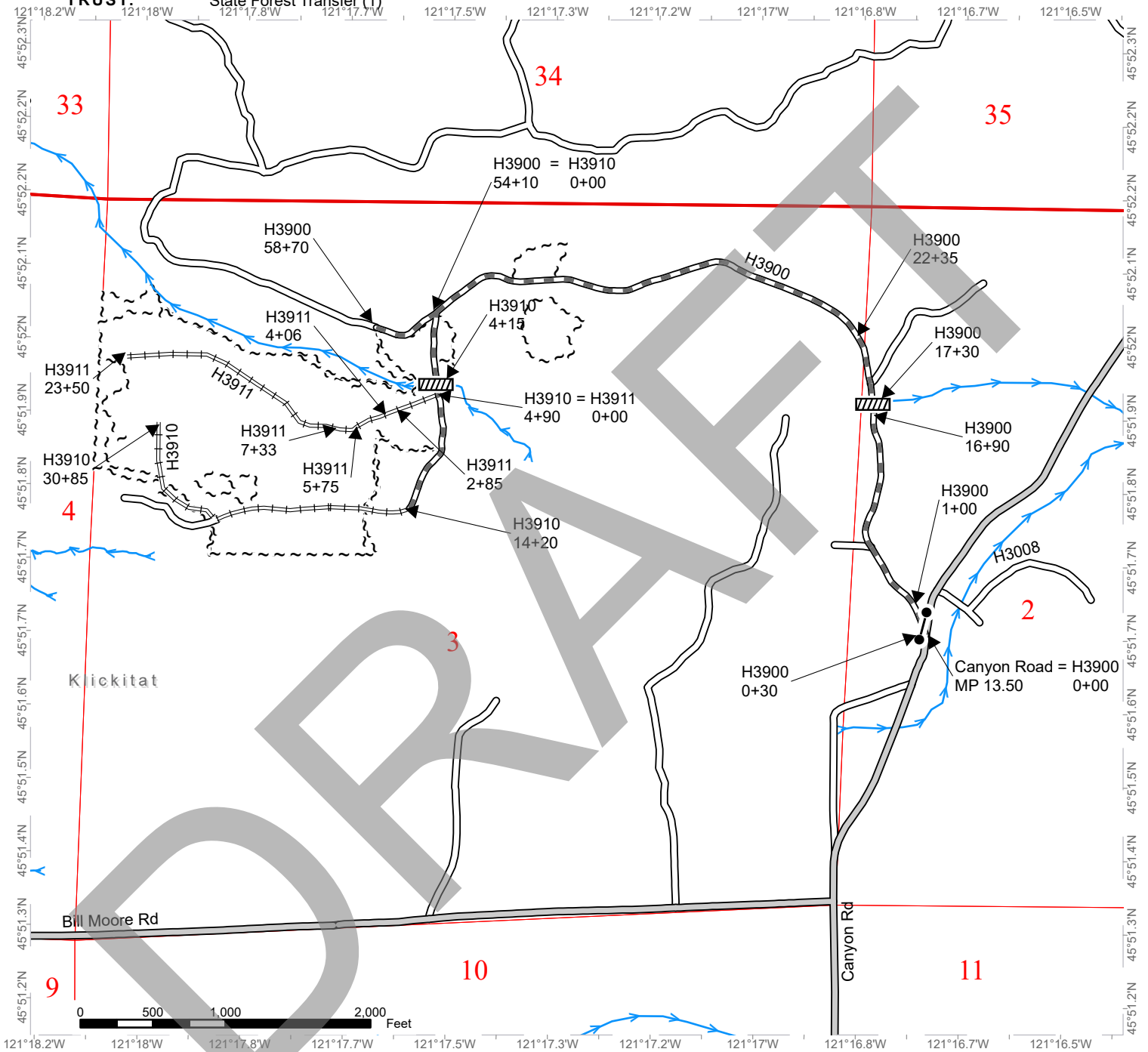
Unit Summary: LIBERTY U1

Sp	Status	Rx	N	D	DBH	BL	THT	BF Gross	BF Net	Defect %	TPA	BA	RD	MBF Net
DF	LIVE	CUT	39	ALL	16.0	66	82	13,018	13,018	0.0	80.2	111.9	28.0	781.1
GF	LIVE	CUT	17	ALL	14.2	63	79	4,593	3,797	17.3	46.0	50.6	13.4	227.8
PP	LIVE	CUT	1	ALL	19.2	69	91	113	113	0.0	0.4	0.9	0.2	6.8
ALL	LIVE	CUT	57	ALL	15.4	65	81	17,724	16,928	4.5	126.6	163.4	41.6	1,015.7
ALL	ALL	ALL	57	ALL	15.4	65	81	17,724	16,928	4.5	126.6	163.4	41.6	1,015.7

ROAD PLAN MAP

SALE NAME: LIBERTY
AGREEMENT#: 30-106233
TOWNSHIP: T4R12E
TRUST: State Forest Transfer (1)

REGION: Southeast Region
COUNTY: Klickitat
ELEVATION RGE: 2280-2400



	County Road
	Existing Roads
	Required Pre-Haul Maintenance
	Required Reconstruction
	Streams
	Sale Boundary Tags
	Culvert
	Gate



STATE OF WASHINGTON
DEPARTMENT OF NATURAL RESOURCES

LIBERTY TIMBER SALE ROAD PLAN
KLICKITAT COUNTY
SOUTHEAST REGION

AGREEMENT NO.: 30-106233

STAFF ENGINEER: TARA BAKER

DATE: FEBRUARY 8, 2024

SECTION 0 – SCOPE OF PROJECT

0-1 ROAD PLAN SCOPE

Clauses in this road plan apply to all road related work, including landings and rock acquisition, unless otherwise noted.

0-2 REQUIRED ROADS

The specified work on the following roads is required.

<u>Road</u>	<u>Stations</u>	<u>Type</u>
H3900	0+00 to 58+70	Pre-haul Maintenance
H3910	0+00 to 14+20	Pre-haul Maintenance
	14+20 to 30+85	Reconstruction
H3911	0+00 to 23+50	Reconstruction

0-5 RECONSTRUCTION

This project includes, but is not limited to the following reconstruction requirements:

<u>Road</u>	<u>Stations</u>	<u>Requirements</u>
H3910	14+20 to 30+85	Clearing, grubbing, subgrade widening, compaction, debris disposal, and culvert cleaning.
H3911	0+00 to 23+50	Clearing, grubbing, compaction, subgrade widening, debris disposal, reconstruction of road prism per slope stakes.

0-6 PRE-HAUL MAINTENANCE

This project includes, but is not limited to the following pre-haul maintenance requirements:

<u>Road</u>	<u>Stations</u>	<u>Requirements</u>
H3900	0+00 to 1+00	Brushing, grading, compaction, and acquisition and placement of 1 ½" minus crushed rock.
	1+00 to 16+90	Brushing, grading and compaction.
	16+90 to 22+35	Brushing, grading, compaction, acquisition and placement of 1 ½" minus crushed rock.
	22+35 to 58+70	Brushing, grading and compaction.
H3910	0+00 to 14+20	Brushing, grading and compaction.

SECTION 1 – GENERAL

1-1 ROAD PLAN CHANGES

If the Purchaser desires a change from this road plan including, but not limited to, relocation, extension, change in design, or adding roads; a revised road plan must be submitted in writing to the Contract Administrator for consideration. Before work begins, Purchaser shall obtain approval from the State for any submitted plan that changes the scope of work or environmental condition from the original road plan.

1-2 UNFORESEEN CONDITIONS

Quantities established in this road plan are minimum acceptable values. Additional quantities required by the state due to unforeseen conditions, or Purchaser's choice of construction season or techniques will be at the Purchaser's expense. Unforeseen conditions include, but are not limited to, solid subsurface rock, subsurface springs, saturated ground, and unstable soils.

1-3 ROAD DIMENSIONS

Purchaser shall perform road work in accordance with the dimensions shown on the TYPICAL SECTION SHEET and the specifications within this road plan, unless controlled by construction stakes.

1-4 ROAD TOLERANCES

Purchaser shall perform road work within the tolerances listed below. The tolerance class for each road is listed on the TYPICAL SECTION SHEET.

<u>Tolerance Class</u>	<u>A</u>	<u>B</u>	<u>C</u>
Road and Subgrade Width (feet)	+1.5	+1.5	+2.0
Subgrade Elevation (feet +/-)	0.5	1.0	2.0
Centerline alignment (feet lt./rt.)	1.0	1.5	3.0

1-6 ORDER OF PRECEDENCE

Any conflict or inconsistency in the road plan will be resolved by giving the documents precedence in the following order:

1. Addenda.
2. Designs or Plans. On designs and plans, figured dimensions shall take precedence over scaled dimensions.
3. Road Plan Clauses.
4. Typical Section Sheet.
5. Standard Lists.
6. Standard Details.
7. Road Plan maps.

In case of any ambiguity or dispute over interpreting the road plan, the Contract Administrator’s or designee’s decision will be final.

1-8 REPAIR OR REPLACEMENT OF DAMAGED MATERIALS

Purchaser shall repair or replace all materials, roadway infrastructure, and road components damaged during road work or operation activities. The Contract Administrator will direct repairs and replacements. Repairs to structural materials must be made in accordance with the manufacturer’s recommendation and may not begin without written approval from the Contract Administrator.

1-9 DAMAGED METALLIC COATING

Any cut ends, or damaged galvanized or aluminized coating on existing or new bridge components, culverts, downspouts, and flumes must be cleaned and treated with a minimum of two coats of zinc rich paint or cold galvanizing compound.

1-15 ROAD MARKING

Purchaser shall perform road work in accordance with the state’s marked location. All road work is marked as follows:

- 4’ lathe with orange flagging for construction and reconstruction.
- Construction staked with 2’ stake at top of cut and top of cut reference points.

1-16 CONSTRUCTION STAKES SET BY STATE

Purchaser shall perform work on the following road in accordance with the construction stakes set in the field for grade and alignment. Reconstruction of existing road grades must conform to the original location except where construction staked or designed.

<u>Road</u>	<u>Stations</u>	<u>Type</u>
H3911	2+85 to 4+06	Slope Stake
H3911	5+75 to 7+33	Slope Stake

1-18 REFERENCE POINT DAMAGE

Purchaser shall reset reference points (RPs) that were moved or damaged at any time during construction to their original locations. Excavation and embankment may not proceed on road segments controlled by said RPs until Purchaser resets all moved or damaged RPs.

1-20 COMPLETE BY DATE

Purchaser shall complete reconstruction, and pre-haul maintenance before the start of timber haul.

1-21 HAUL APPROVAL

Purchaser shall not use roads under this road plan for any hauling without written approval from the Contract Administrator.

1-22 WORK NOTIFICATIONS

On all roads, the Purchaser shall notify the Contract Administrator a minimum of 7 calendar days before work begins.

1-23 ROAD WORK PHASE APPROVAL

Purchaser shall obtain written approval from the Contract Administrator upon completion of each of the following phases of road work:

- Subgrade construction
- Subgrade compaction
- Rock application
- Rock compaction

1-25 ACTIVITY TIMING RESTRICTION

Required roadwork activities are not allowed during the closure period, November 1st to April 30th, unless authorized in writing by the Contract Administrator.

1-26 OPERATING DURING CLOSURE PERIOD

If permission is granted to operate during a closure period in Contract Clause H-130, Purchaser shall provide a maintenance plan to include further protection of state resources. Purchaser shall obtain written approval from the Contract Administrator for the maintenance plan and shall put preventative measures in place before operating during the closure period.

1-29 SEDIMENT RESTRICTION

Purchaser shall not allow silt-bearing runoff to enter any streams.

1-30 CLOSURE TO PREVENT DAMAGE

In accordance with Contract Clause G-220 STATE SUSPENDS OPERATION, the Contract Administrator will suspend road work or hauling right-of-way timber, forest products, or rock under the following conditions:

- Wheel track rutting exceeds 4 inches on pit run roads.
- Wheel track rutting exceeds 6 inches on native surface roads.
- Weather is such that satisfactory results cannot be obtained in an area of operations.
- When, in the opinion of the Contract Administrator excessive road damage or rutting may occur.

Operations must stop unless authority to continue working or hauling is granted in writing by the Contract Administrator. If surface or base stability problems persist, Purchaser shall cease operations, or perform corrective maintenance or repairs, subject to specifications within this road plan. Before and during any suspension, Purchaser shall protect the work from damage or deterioration.

1-33 SNOW PLOWING RESTRICTION

On all roads, snowplowing will only be allowed after the execution of a SNOW PLOWING AGREEMENT, which is available from the Contract Administrator upon request. If damage occurs while plowing, further permission to plow may be revoked by the Contract Administrator.

1-40 ROAD APPROACHES TO COUNTY ROADS AND STATE HIGHWAYS

Purchaser shall immediately remove any mud, dirt, rock, or other material tracked or spilled on to county roads and state highways.

If additional damage to the surface, signs, guardrails, etc. occurs then the damage will be repaired, at the Purchaser's expense, as directed by the Contract Administrator when authorized by the county.

SECTION 2 – MAINTENANCE

2-1 GENERAL ROAD MAINTENANCE

Purchaser shall maintain all roads used under this contract in accordance with the FOREST ACCESS ROAD MAINTENANCE SPECIFICATIONS for the entire term of this contract. Maintenance is required even during periods of inactivity.

2-2 ROAD MAINTENANCE – PURCHASER MAINTENANCE

Purchaser shall perform maintenance on roads listed in Contract Clause C-050 PURCHASER ROAD MAINTENANCE AND REPAIR in accordance with FOREST ACCESS ROAD MAINTENANCE SPECIFICATIONS.

2-4 PASSAGE OF LIGHT VEHICLES

Purchaser shall maintain all roads in a condition that will allow the passage of light administrative vehicles.

SECTION 3 – CLEARING, GRUBBING, AND DISPOSAL

3-1 BRUSHING

On the following roads, Purchaser shall cut vegetative material up to 3 inches in diameter, including limbs, as shown on the BRUSHING DETAIL. Brushing must be achieved by mechanical cutting of brush, trees, and branches. Root systems and stumps of cut vegetation may not be disturbed unless directed by the Contract Administrator. Purchaser shall remove brushing debris from the road surface, ditchlines, and culvert inlets and outlets.

<u>Road</u>	<u>Stations</u>
H3900	0+00 to 58+70
H3910	0+00 to 14+20

3-5 CLEARING

Purchaser shall fall all vegetative material larger than 2 inches DBH or over 5 feet high between the marked right-of-way boundaries and within waste and debris areas, or if not marked in the field, between the clearing limits specified on the TYPICAL SECTION SHEET. Clearing must be completed before starting excavation and embankment.

3-10 GRUBBING

Purchaser shall remove all stumps between the grubbing limits specified on the TYPICAL SECTION SHEET and within waste and debris areas. Purchaser shall also remove stumps with undercut roots outside the grubbing limits.

3-20 ORGANIC DEBRIS DEFINITION

Organic debris is defined as all vegetative material not eligible for removal by Contract Clause G-010 PRODUCTS SOLD AND SALE AREA or G-011 RIGHT TO REMOVE FOREST PRODUCTS AND CONTRACT AREA, that is larger than one cubic foot in volume within the clearing limits as shown on the TYPICAL SECTION SHEET.

3-21 DISPOSAL COMPLETION

Purchaser shall remove organic debris from the road surface, ditchlines, and culvert inlets and outlets. Purchaser shall complete all disposal of organic debris, except burning, before start of timber haul.

3-23 PROHIBITED DISPOSAL AREAS

Purchaser shall not place organic debris in the following areas:

- Within 50 feet of a cross drain culvert.
- Within 100 feet of a live stream, or wetland.
- On road subgrades, or excavation and embankment slopes.
- On slopes greater than 40%.
- On locations where brush can fall into the ditch or onto the road surface.
- Against standing timber.

3-24 BURYING ORGANIC DEBRIS RESTRICTED

Purchaser shall not bury organic debris unless otherwise stated in this plan.

3-25 SCATTERING ORGANIC DEBRIS

On the following roads, Purchaser shall scatter organic debris outside of the clearing limits in natural openings on both sides of the road. Where natural openings are unavailable or restrictive, alternate debris disposal methods are subject to the written approval of the Contract Administrator.

<u>Road</u>	<u>Stations</u>
H3900	0+00 to 58+70
H3910	0+00 to 14+20

SECTION 4 – EXCAVATION

4-2 PIONEERING

Pioneering may not extend past construction that will be completed during the current construction season. Pioneering may not extend more than 1000 feet beyond completed construction unless approved in writing by the Contract Administrator. In addition, the following actions must be taken as pioneering progresses:

- Drainage must be provided on all uncompleted construction.
- Road pioneering operations may not undercut the final cut slope or restrict drainage.

4-3 ROAD GRADE AND ALIGNMENT STANDARDS

Purchaser shall follow these standards for road grade and alignment except as designed:

- Grade and alignment must have smooth continuity, without abrupt changes in direction.
- Maximum grades may not exceed 18 percent favorable and 12 percent adverse.
- Minimum curve radius is 60 feet at centerline.
- Maximum grade change for sag vertical curves is 5% in 100 feet.
- Maximum grade change for crest vertical curves is 4% in 100 feet.

4-5 CUT SLOPE RATIO

Purchaser shall construct excavation slopes no steeper than shown on the following table:

<u>Material Type</u>	<u>Excavation Slope Ratio</u>	<u>Excavation Slope Percent</u>
Common Earth (on side slopes up to 55%)	1:1	100
Common Earth (56% to 70% side slopes)	¾:1	133
Common Earth (on slopes over 70%)	½:1	200
Fractured or loose rock	½:1	200
Hardpan or solid rock	¼:1	400

4-6 EMBANKMENT SLOPE RATIO

Purchaser shall construct embankment slopes no steeper than shown on the following table:

<u>Material Type</u>	<u>Embankment Slope Ratio</u>	<u>Embankment Slope Percent</u>
Sandy Soils	2:1	50
Common Earth and Rounded Gravel	1½:1	67
Angular Rock	1¼:1	80

4-7 SHAPING CUT AND FILL SLOPE

Purchaser shall construct excavation and embankment slopes to a uniform line and left rough for easier revegetation.

4-8 CURVE WIDENING

The minimum widening placed on the inside of curves is:

- 6 feet for curves of 50 to 79 feet radius.
- 4 feet for curves of 80 to 100 feet radius.

4-9 EMBANKMENT WIDENING

The minimum embankment widening is:

- 2 feet for embankment heights at centerline of 2 to 6 feet.
- 4 feet for embankment heights at centerline of greater than 6 feet.

4-10 WIDEN THE EXISTING SUBGRADE

On the following roads, Purchaser shall widen the subgrade and fill slopes to the dimensions shown on the TYPICAL SECTION SHEET. If necessary, Purchaser shall reconstruct excavation slopes to provide sufficient width for the road surface and any ditches.

<u>Road</u>	<u>Stations</u>
H3910	14+20 to 30+85
H3911	0+00 to 23+50

4-35 WASTE MATERIAL DEFINITION

Waste material is defined as all dirt, rock, mud, or related material that is extraneous or unsuitable for construction material. Waste material, as used in Section 4 EXCAVATION, is not organic debris.

4-38 PROHIBITED WASTE DISPOSAL AREAS

Purchaser shall not deposit waste material in the following areas:

- Within 50 feet of a cross drain culvert.
- Within 100 feet of a live stream or wetland.
- On side slopes steeper than 40%.
- In locations that interfere with the construction of the road prism.
- In locations that impede drainage.
- Against standing timber.

4-55 ROAD SHAPING

Purchaser shall shape the subgrade and surface as shown on the TYPICAL SECTION SHEET. The subgrade and surface shape must ensure runoff in an even, un-concentrated manner, and must be uniform, firm, and rut-free.

4-56 DRY WEATHER SHAPING

At any time of the year, the Contract Administrator may require the application of water to facilitate shaping activities. The method of water application is subject to written approval by the Contract Administrator.

4-60 FILL COMPACTION

Purchaser shall compact all embankment and waste material in accordance with the COMPACTION LIST by routing excavation equipment over the entire width of each lift. Waste material may be placed by end-dumping or sidecasting until sufficiently wide enough to support the equipment.

4-62 DRY WEATHER COMPACTION

At any time of the year, the Contract Administrator may require the application of water to facilitate compaction activities. The method of water application is subject to written approval by the Contract Administrator.

SECTION 5 – DRAINAGE

5-33 NATIVE SURFACE ROADS

If overwintered, native surface roads must be waterbarred by November 1. Purchaser shall construct waterbars according to the attached DRIVABLE WATERBAR DETAIL at a maximum spacing that will produce a vertical distance of no more than 10 feet between waterbars or between natural drainage paths, and with a maximum spacing of 300 feet.

SECTION 6 – ROCK

6-5 ROCK FROM COMMERCIAL SOURCE

Rock used in accordance with the quantities on the ROCK LIST shall be obtained from a commercial source at the Purchaser's expense. Rock sources are subject to written approval by the Contract Administrator before its use.

6-29 1 ½-INCH MINUS CRUSHED ROCK

% Passing 1 ½" square sieve	100%
% Passing 1" square sieve	70 - 90%
% Passing 5/8" square sieve	50 - 80%
% Passing U.S. #4 sieve	30 - 50%
% Passing U.S. #40 sieve	3 - 18%
% Passing U.S. #200 sieve	7.5% maximum

The portion of aggregate retained on the No. 4 sieve may not contain more than 0.2 percent organic debris and trash. All percentages are by weight.

6-55 ROCK APPLICATION MEASURED BY COMPACTED DEPTH

Measurement of specified rock depths, are defined as the compacted depths using the compaction methods required in this road plan. Estimated quantities specified in the ROCK LIST 1 ½" MINUS CRUSHED are compacted yards. Purchaser shall apply adequate amounts of rock to meet the specified rock depths. Specified rock depths are minimum requirements and are not subject to reduction.

6-70 APPROVAL BEFORE ROCK APPLICATION

Purchaser shall obtain written approval from the Contract Administrator for subgrade before rock application.

6-71 ROCK APPLICATION

Purchaser shall apply rock in accordance with the specifications and quantities shown on the ROCK LIST – 1 ½" MINUS CRUSHED ROCK must be spread, shaped, and compacted full width concurrent with rock hauling operations. Road surfaces must be compacted in accordance with the COMPACTION LIST by routing excavation equipment over the entire width.

6-76 DRY WEATHER ROCK COMPACTION

The Contract Administrator may require the application of water to facilitate compaction of rock surfacing. The method of water application is subject to approval by the Contract Administrator.

SECTION 7 – STRUCTURES

7-1 SIGN INSTALLATION

Purchaser shall install and maintain the following road sign. Signs must be installed a minimum of 7 days before log haul commences.

<u>Road</u>	<u>Station</u>	<u>Comment</u>	<u>Sign</u>
Canyon Road	MP 13.4	South of Canyon Road and H3900 junction	Log Trucks
Canyon Road	MP 13.6	North of Canyon Road and H3900 junction	Log Trucks

7-70 GATE CLOSURE

On the following road, Purchaser shall keep gates closed and locked except during periods of haul. All gates must be closed at termination of use.

<u>Road</u>	<u>Station</u>	<u>Comment</u>
H3900	0+30	Four-wire cattle gate

SECTION 9 – POST-HAUL ROAD WORK

9-5 POST-HAUL MAINTENANCE

Purchaser shall perform post-haul maintenance in accordance with the FOREST ACCESS ROAD MAINTENANCE SPECIFICATIONS.

<u>Road</u>	<u>Stations</u>
H3900	0+00 to 58+70
H3910	0+00 to 30+85
H3911	0+00 to 23+50

9-6 CLEANING CULVERTS

On the following roads, Purchaser shall clean the inlets and outlets of all culverts.

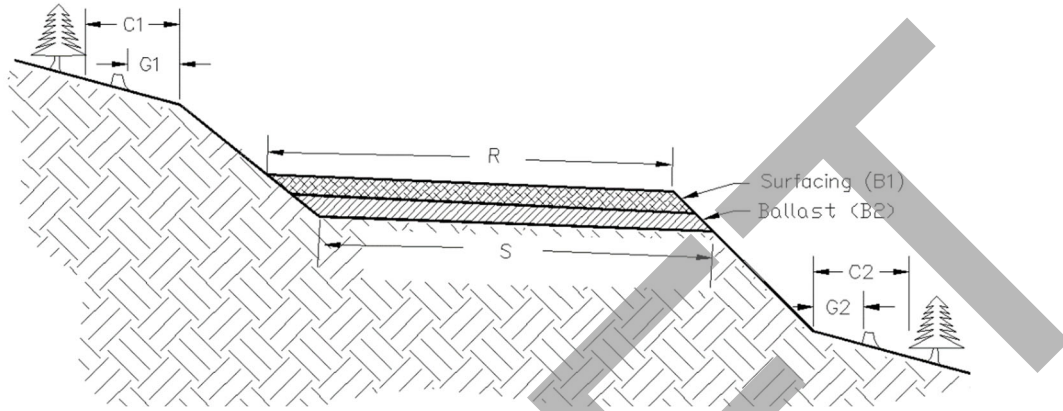
<u>Road</u>	<u>Station</u>
H3900	17+30
H3910	4+15

9-10 LANDING DRAINAGE

Purchaser shall provide for positive drainage of all landing surfaces.

TYPICAL SECTION SHEET

OUTSLOPED ROAD CROSS-SECTION
(not to scale)

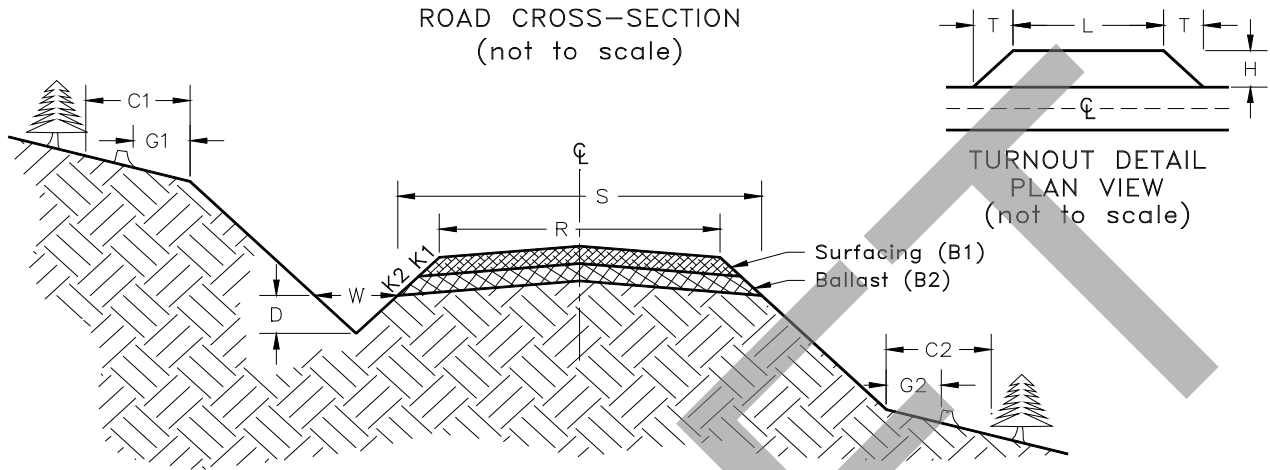


NO
RECO
EDGE
CLEA
RIGHT
FLAG
RIGH

ROAD	CONSTRUCTION/ RECONSTRUCTION/ PRE-HAUL	FROM STATION	TO STATION	TOL. CLASS	SUBGRADE WIDTH S	CROWN INCHES @ CENTERLINE	OUTSLOPE INCHES IN 10 FEET	ROAD WIDTH R	DITCH WIDTH DEPTH W D		GRUBBING LIMITS G1 G2		CLEARING LIMITS C1 C2	
H3900	Pre-haul Maintenance	0+00	58+70		12'		4"	14'	NA	NA	NA		See Note	
H3910	Pre-haul Maintenance	0+00	14+20		12'		4"	12'	NA	NA	NA		See Note	
	Reconstruction	14+20	30+85	C	12'		4"	12'	NA	NA	See Note		See Note	
H3911	Reconstruction	0+00	23+50	C	12'		4"	12'	NA	NA	See Note		See Note	

DRAFT

ROCK LIST – 1½” MINUS CRUSHED



Road Number	From Station	To Station	Rock Slope K2	Compacted Rock Depth B2	C.Y./ Station	# of Stations	C.Y. Subtotal	Rock Source
H3900	0+00	1+00	1 ½ :1	3"	14	1.00	14	Commercial
H3900	16+90	22+35	1 ½ :1	3"	14	5.45	76	Commercial

TOTAL 90 Cubic Yards

COMPACTION LIST

Road	From Station	To Station	Type	Equipment Type	Equipment Weight (lbs)	Minimum Number of Passes	Maximum Operating Speed (mph)
H3900	0+00	58+70	Subgrade Rock	Vibratory Smooth Drum	16000	3	3
H3910	0+00	30+85	Subgrade	Vibratory Smooth Drum	16000	3	3
H3911	0+00	23+50	Subgrade	Vibratory Smooth Drum	16000	3	3

DRAFT

RIGHT-OF-WAY SPECIFICATION SHEET

Based on a 12' road width. All clearing distances are measured horizontally from the centerline of the road. All ditches are 1' deep. Ditched roads are crowned 4" at the centerline. Roads with no ditch are outsloped 4" in 10'.

CROWNED ROAD WITH DITCH RIGHT

<u>Sideslope</u>	<u>Clearing Left</u>	<u>Clearing Right</u>
0-10%	16'	14'
10-20%	17'	15'
20-30%	19'	17'
30-40%	22'	18'
40-50%	27'	22'

OUTSLOPE LEFT ROAD

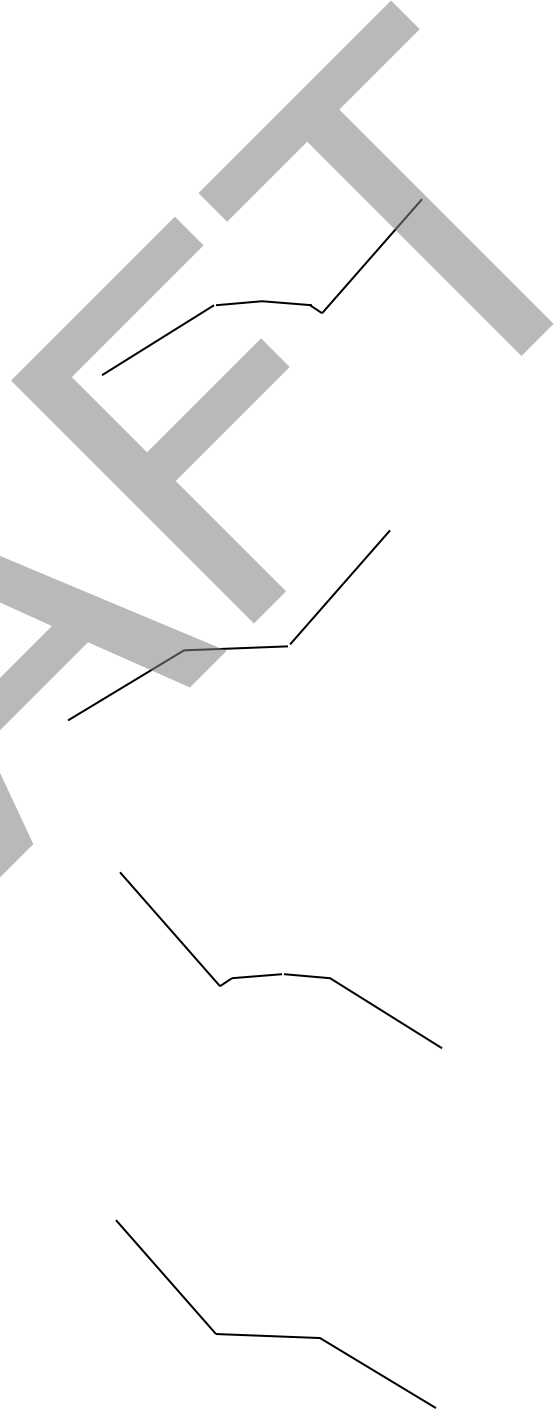
<u>Sideslope</u>	<u>Clearing Left</u>	<u>Clearing Right</u>
0-10%	16'	11'
10-20%	17'	12'
20-30%	19'	13'
30-40%	22'	15'
40-50%	27'	17'

CROWNED ROAD WITH DITCH LEFT

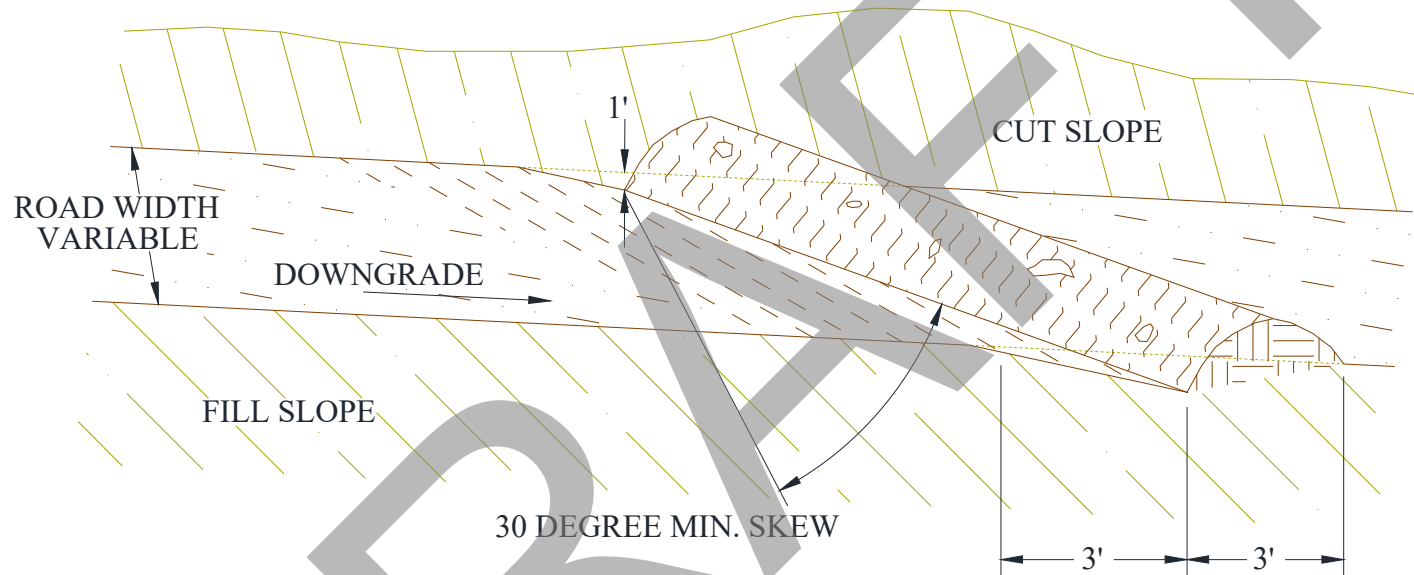
<u>Sideslope</u>	<u>Clearing Left</u>	<u>Clearing Right</u>
0-10%	14'	16'
10-20%	15'	17'
20-30%	17'	19'
30-40%	18'	22'
40-50%	22'	27'

OUTSLOPE RIGHT ROAD

<u>Sideslope</u>	<u>Clearing Left</u>	<u>Clearing Right</u>
0-10%	11'	16'
10-20%	12'	17'
20-30%	13'	19'
30-40%	15'	22'
40-50%	17'	27'



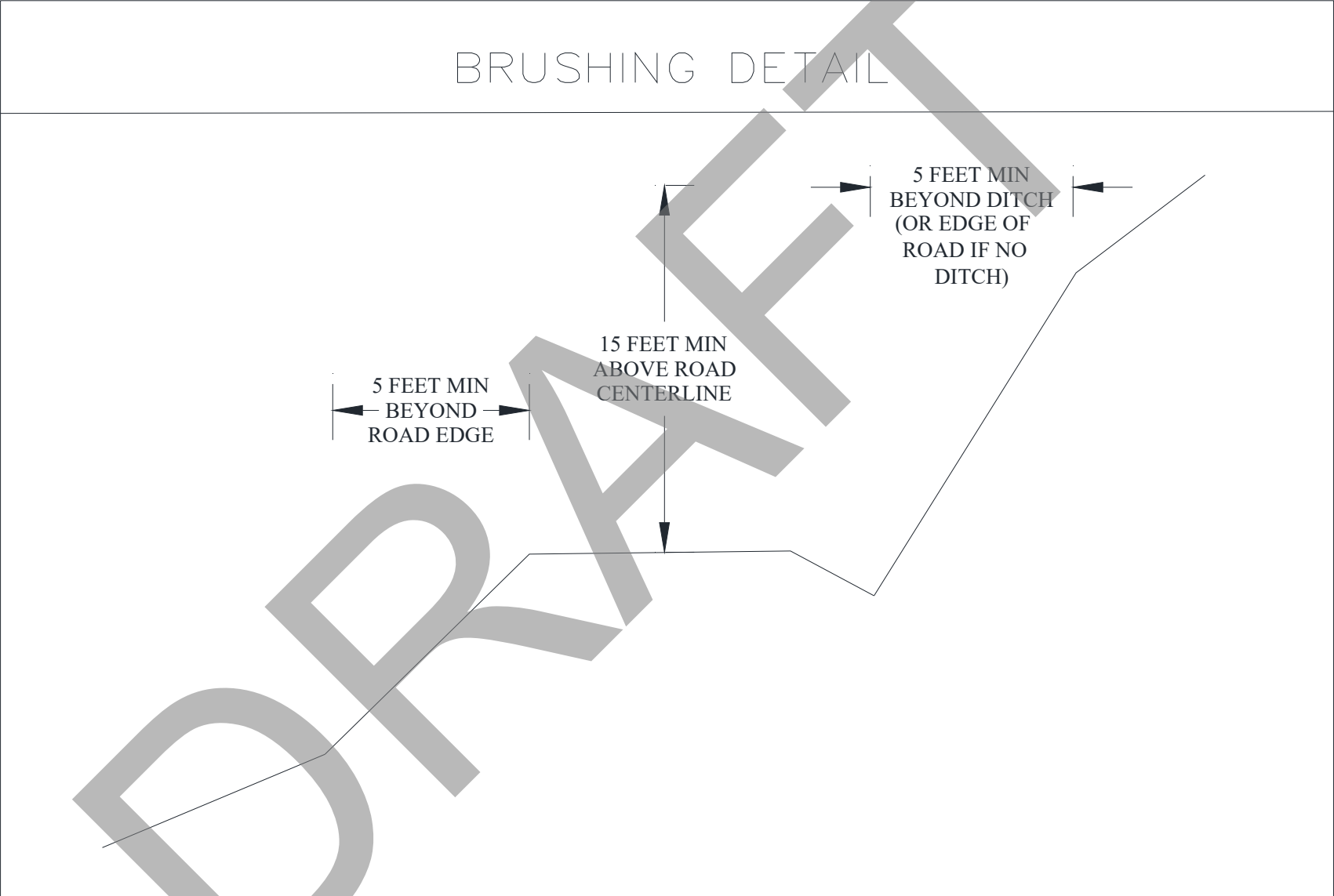
DRIVABLE WATER BAR DETAIL



NOTES:

1. ALL WATER BARS SHALL BEGIN AT THE INTERSECTION OF THE ROADBED AND CUT SLOPE AND RUN ACROSS THE ENTIRE WIDTH OF THE ROADBED.
2. ALL WATER BARS SHALL HAVE FREE FLOWING OUTLETS.

BRUSHING DETAIL



FOREST ACCESS ROAD MAINTENANCE SPECIFICATIONS

Cuts and Fills

- Maintain slope lines to a stable gradient compatible with the cut slope/fill slope ratios. Remove slides up to 50 cubic yards in volume from ditches and the roadway. Repair fill-failures, in accordance with Clause 4-6 EMBANKMENT SLOPE RATIO, with selected material or material approved by the Contract Administrator. Remove overhanging material from the top of cut slopes.
- Waste material from slides or other sources shall be placed and compacted in stable locations identified in the road plan or approved by the Contract Administrator, so that sediment will not deliver to any streams or wetlands.
- Slide material and debris shall not be mixed into the road surface materials, unless approved by the Contract Administrator.

Surface

- Grade the road surface, turnouts, and shoulders to the original shape on the TYPICAL SECTION SHEET to provide a smooth, rut-free traveled surface and maintain surface water runoff in an even, unconcentrated manner.
- Blading shall not undercut the backslope or cut into geotextile fabric on the road.
- If required by the Contract Administrator, water shall be applied as necessary to control dust and retain fine surface rock.
- Surface material shall not be bladed off the roadway. Replace surface material when lost or worn away, or as directed by the Contract Administrator.
- Remove shoulder berms, created by grading, to facilitate drainage, except as marked or directed by the Contract Administrator.
- For roads with geotextile fabric: spread surface aggregate to fill in soft spots and wheel ruts (barrel spread) to prevent damage to the geotextile fabric.

Drainage

- Prevent silt bearing road surface and ditch runoff from delivering sediment to any streams or wetlands.
- Maintain rolling dips and drivable waterbars as needed to keep them functioning as intended.
- Maintain headwalls to the road shoulder level with material that will resist erosion.
- Maintain energy dissipaters at culvert outlets with non-erodible material or rock.
- Keep ditches, culverts, and other drainage structures clear of obstructions and functioning as intended.
- Inspect and clean culverts at least monthly, with additional inspections during storms and periods of high runoff. This shall be done even during periods of inactivity.

Preventative Maintenance

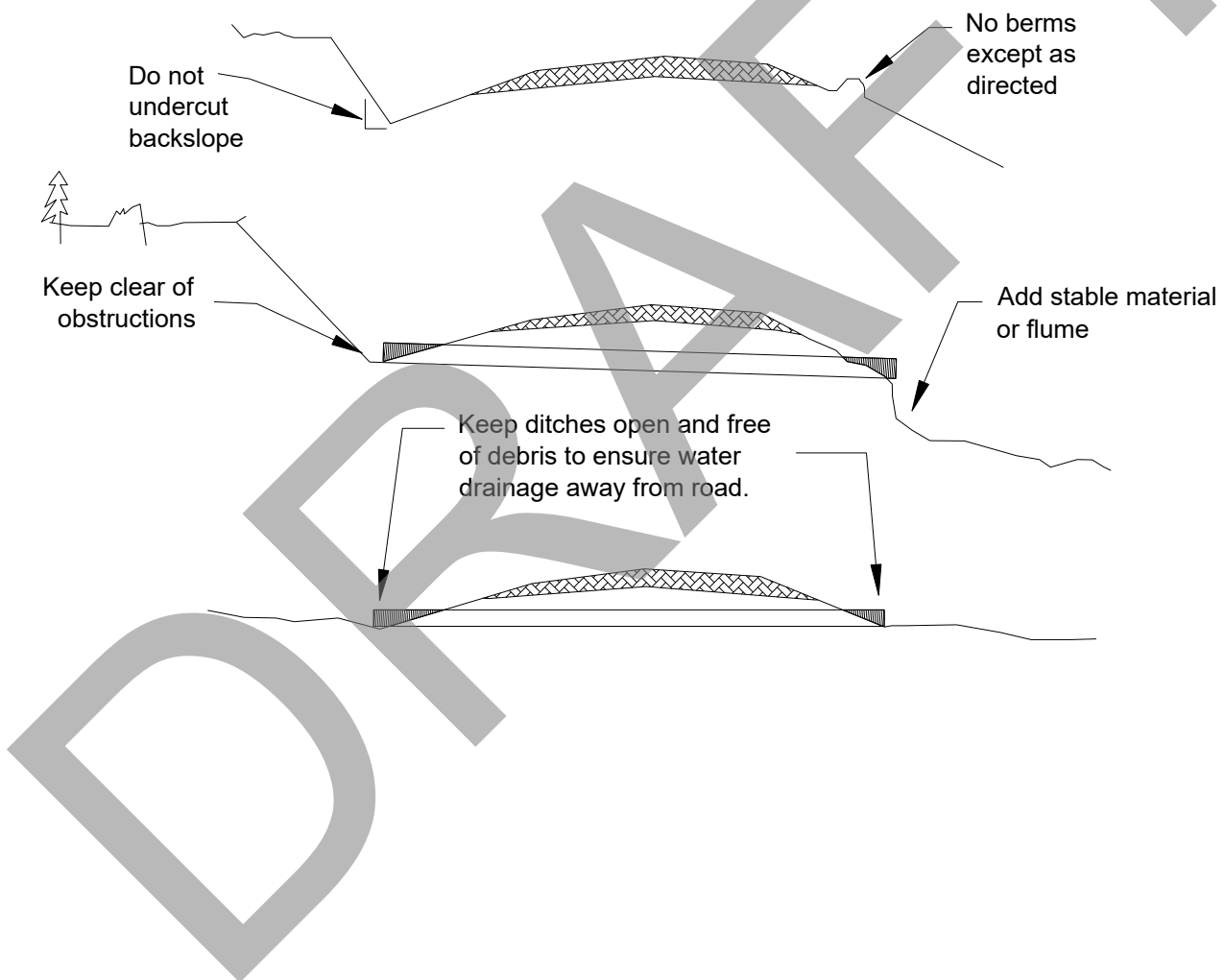
- Perform preventative maintenance work to safeguard against storm damage, such as blading to ensure correct runoff, ditch, and culvert cleaning, and waterbar maintenance.

Termination of Use or End of Season

- At the conclusion of logging operations, ensure all conditions of these specifications have been met.

Debris

- Remove fallen timber, limbs, and stumps from the slopes, roadway, ditchlines, and culvert inlets.



SUMMARY - Road Development Costs

REGION: Southeast

UNIT: Klickitat

SALE/PROJECT NAME: Liberty CONTRACT #: 30-106233

ROAD NUMBERS:	H3910, H3911	H3900, H3910
ROAD STANDARD:	Reconstruction	Maintenance
NUMBER OF STATIONS:	40.15	72.90
CLEARING & GRUBBING:	\$4,898.30	
EXCAVATION AND FILL:	\$6,022.50	-
MISC. MAINTENANCE:		\$3,236.76
ROAD ROCK:		\$3,294.14
MOBILIZATION:	\$1,029.94	\$1,870.06
TOTAL COSTS:	\$11,950.74	\$8,400.96
COST PER STATION:	\$297.65	\$115.24
FINAL MAINTENANCE:	\$1,315.28	
POST-HAUL MOBILIZATION:	\$1,050.00	
CONTRACTOR OVERHEAD:	\$3,407.55	

TOTAL (All Roads) = \$26,124.53
SALE VOLUME MBF = 1,016
TOTAL \$/MBF = \$25.71

Compiled by: Tara Baker

Date: 1/2/2023